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MATERIALISM

ANCIENT AND MODERN

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BY A LATE FELLOW OF TRINITY COLLEGE
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I.

ON NATURE.

IN a controversy respecting the relative merits and capabilities of the German and French languages, the advocate for the latter challenged his adversary to translate 'Nature' into pure German. There was no response. It could not be denied that the Teutons had borrowed the word 'Natur' from the Latin, or some Latin dialect; and their language, therefore, stood condemned, as wanting a word to express a conception of the most ordinary character.

I have since been led to inquire into the meaning of this word, so frequently employed both in its original form, as a substantive, and in its derivatives, 'natural' and 'super-

natural,' and I have arrived at the conclusion that a language is not to be hastily convicted of poverty, because it does not offer a word of equivalent sense.

The word 'Nature' is sometimes employed to denote the objects of sense collectively, as when we speak of the 'beauties of Nature;' and when it receives this meaning, it may be rendered by the Teutonic *Welt* with sufficient accuracy. But the word we are considering frequently receives another and a very different signification, even from philosophical writers, who speak of Nature as possessing a generative or directive and foreseeing, if not a creative, power.

We sometimes hear it said that the love of parents for their children is a provision of, or is implanted by Nature, for the preservation of the species. Gravitation is said to be a law of Nature. Such and such things come 'by nature,' 'are natural.' There is a

power by which they are what they are, a power, not intelligent, not independent of material things or energies, but pervading and directing them. Fire burns 'by nature,' and so on.

These forms of expression are so common that we have much difficulty in dispensing with the use of them; but I hold them to involve an erroneous assumption: and it is for the word Nature when so employed that we seek in vain for a Teutonic equivalent, and are forced to employ the Latin 'Natura.' I propose to inquire whether when so used, when used as something distinct from *Welt*, the word possesses a meaning which deserves to be expressed.

In the first place, we may safely assert that Nature, supposing it to be something other than the objects of sense—[1]external things, as they are called—cannot

[1] I use the expression, believing it to be generally intelligible, not as philosophically accurate.

itself be an object of sense. It would, otherwise, be an external thing, or a combination of external things. In order that a belief in the existence of Nature in the sense we are considering may be justified, we must show that the supposition or hypothesis of the existence of Nature is probable; or, in other words, we must show that the supposition, if adopted, accounts for and explains observed phenomena. But how can the supposition that an unintelligent power exists account for the phenomena which we observe? We are led to believe that the objects of our senses act upon each other, and upon our senses in modes which, in many instances, we can define. Why they so act we do not know.

Admit that there exists an unintelligent power called Nature, which pervades all things: how does this supposition help us to explain observed phenomena? Bodies attract each other. Why? By a law of

Nature. It is Nature which causes their mutual attraction. Why does Nature cause attraction? Nature proposes no end to itself, since, by supposition, it is unintelligent. Nature, then, for no reason that we can assign, causes bodies to attract each other. It might equally cause them to repel each other. Parents love their children by a provision of Nature. Why do not parents hate their children by a provision of Nature, if Nature is unintelligent? The supposition that an unintelligent power called Nature exists explains nothing. We must, therefore, lay aside the hypothesis that such an unintelligent power exists.

If we reject the supposition that there exists an unintelligent power under the name Nature, then the term 'natural' loses the signification which is frequently attached to it. That is considered natural which exists or occurs by nature, by means of an unintelligent power, as supernatural is

applied to occurrences referred by us to an intelligent power, interrupting the course of events which take place by the unintelligent power, or Nature. We must, therefore, if we wish our language to be in accordance with philosophy, reject the terms 'natural' and 'supernatural' in their ordinary signification, as importing a distinction which cannot be shown to exist.

We may, of course, if we please, employ the word Nature to denote ordinary existences and occurrences, but there is this objection to such employment, that it does by usage imply not only that the existences and occurrences to which it is applied are ordinary, but also that the origin of these existences and occurrences is in some way explained by the assumption of an unintelligent power called Nature. It seems, therefore, safer to discard this word in philosophical discussion as productive of error; and to employ in its stead

the words 'external objects,' and instead of 'natural' to adopt 'usual' or 'ordinary,' and instead of 'supernatural' to use the words 'unusual' or 'excessively unusual.'

II.

ANCIENT MATERIALISM.

IF we lay aside, as wholly without rational foundation, the hypothesis of an unintelligent power called Nature, then it appears to me that we are reduced to the choice between two other suppositions in order to account for usual existences and occurrences: namely, the supposition that they result from intelligence, and the supposition that they result without intelligence or, in other words, from chance. If we do not admit intelligence as a cause of these existences and occurrences—if we say that they arise without any intelligence—I see no alternative but chance, the negation of intelligence.

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The theory that all things have their origin in chance, advanced by Epicurus, is known to us best by the work of Lucretius *De Rerum Naturâ.* All that the subtle intellect of the Grecian master—all that the poetical genius of his Roman disciple—could contribute towards rendering this theory attractive and plausible, has been lavished on its development. Yet, in the first place, the whole theory rests on a very disputable assumption—the eternal existence of particles of matter, indivisible, perfectly hard, and constantly coming into collision with each other; and, in the next place, the assumption, if accepted, does not explain the facts supposed to result from it. No attempt even is made to assign a cause for the existence of these particles; they are assumed to exist and to be put in motion by Nature; in other words, without a cause. For, besides these particles, according to Epicurus, nothing exists, except indeed the

'Natura Deorum,' which in no degree interferes with the visible world—

'Semota a nostris rebus sejunctaque longe.'

And it is scarcely necessary to observe that even this assumption is wholly insufficient to explain the most ordinary phenomena. These phenomena are noted by Lucretius with much ability—the generations of animals and vegetables succeeding each other, constantly preserving a resemblance to their predecessors, and differing from them within certain limits. This is the result of what he terms the 'semina rerum:' but how these semina are produced by his atoms he does not explain. This very constancy in 'the nature of things,' to which he frequently alludes, seems entirely out of harmony with his premises, where chance governs all. The difficulties of Lucretius are immensely increased when he attempts to explain the existence of sensation. How, out of par-

ticles possessing, by hypothesis, only hardness and weight, can be constructed a sentient being? How is it that particles, absolutely void of sensation, should, by being assembled in certain groups (the result of accident), become endowed with sensation, an entirely new quality, in no manner resembling any quality which, by supposition, the separate particles possess, differing from those qualities, not in degree, but in essence and kind? How all this comes about remains without even an attempt at solution.

The only resource of Lucretius is to suppose that the particles of the soul and mind, 'anima' and 'animus,' are much smaller than other particles. But it is obvious that this supposition does not help him to explain why these very small particles, collected in sufficient numbers, *feel* and *think*. He would repudiate the notion that the individual particles possess these qualities—

such a notion would destroy the very basis of his theory—and he does not explain how their aggregation can give birth to totally new faculties.

He, in fact, asserts that the 'anima' and 'animus' must consist of particles, because he has established to his own satisfaction that nothing exists besides hard and indestructible particles; and then, taking cognisance of only one phenomenon, that of death, from the body remaining unaltered at the moment when death takes place, when the 'anima' and 'animus' disappear, he concludes that only very minute particles have been withdrawn, and that the mind and soul, therefore, consist of such particles.

The mode in which Lucretius explains the existence of free-will is still more remarkable. The particles of matter fall through the void, and their collisions give rise to all the phenomena of Nature; but they do not fall quite vertically. If they

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did, all things would be bound by an iron and inflexible rule of fate. Therefore, they must decline a little, a very little, from the vertical. Why they decline from the vertical is as little explained as why they fall vertically, and we are left equally in the dark as to the manner in which freedom of will is produced by these exceedingly small deviations. After this we may well ask whether any faith can exceed the faith which philosophers place in their own theories.

III.

MODERN MATERIALISM.

IT is not a very uncommon belief that modern discoveries have rendered the materialist theory more probable, that they have gone far towards demonstrating that all phenomena are produced by the combination of material particles acting according to certain general laws.

But it may be observed, in the first place, that the assumptions on which this conclusion is based are much larger than those of Lucretius. His hypothesis required an infinite number of perfectly hard particles existing from eternity to eternity, perpetually in motion, and constantly coming in contact with each other. The superstruc-

ture of modern materialism also is built on the hypothesis of an infinite number of indivisible particles, self-existing from eternity to eternity.

But these particles are divided into many classes, each class constituting a simple substance. And the particles of each class differ widely from the particles of another class. They differ in weight, and in their affinities with other particles. Particles of different classes combine according to certain laws, but these laws are various, and discovered only by experience. Moreover, besides the simple substances composed of particles, there are certain agents or energies differing from all these classes more widely than the classes differ among themselves. The agents called heat, electricity, magnetism, light, etc., are also subject to laws, as they are termed, but to laws by no means similar to those which govern the action of the simple substances on each other, and

sometimes interfering greatly with those actions. Again, I imagine no one at the present day believes, that the ultimate particles received by modern science actually come into collision with each other, or that if they did come into such contact, the fact would explain in the smallest degree the various qualities of the simple substances. The modern materialist must therefore, before attempting to explain the phenomena of matter, require to have granted the self-existence of an apparatus of particles, far more complicated than that imagined to be sufficient for this purpose by the ancient philosophers. The particles must be supposed to be endowed with various qualities, to associate with each other according to various laws, and to be acted upon by those energies we have mentioned (whether themselves consisting of particles or not) according to other laws, doubtless certain, but not yet by any means fully ascertained.

The modern material hypothesis, therefore, draws much more largely on the faith of its professors, than the ancient materialistic doctrine; which only demanded the eternal existence of an infinite number of perfectly hard particles, of various sizes, coming constantly into collision with each other, diverging from the direction of their motion, only very slightly, in order to account for free-will.

But if the modern schools of material philosophy demand wider assumptions than the ancient, with regard to the self-existing particles which it requires to have granted, we must admit that its success in explaining the phenomena of matter is much more than proportionately increased. Or, perhaps, we should speak more correctly by saying that the ancient philosophy explained nothing, the modern much. Although the laws by which small parts of bodies act upon each other are still unknown, and although the laws of

crystallisation even are still undiscovered, yet we know with accuracy the results which will ensue from the close contact of bodies, whether simple or compound, and from the application to them of heat and electricity: and, that the field of discovery will hereafter be widened, almost indefinitely, can scarcely be doubted.

An enthusiastic disciple of the modern materialist school might even find little difficulty in believing, that the varied phenomena of vegetable life may one day be deduced from certain qualities of the simple substances, of which vegetables are composed. I believe, however, I am correct in saying that not a single step in this direction has as yet been made.

But the difficulty, to which all other difficulties appear light, has been as little surmounted by the modern as by the ancient materialist. The one can as little as the other pass over the gulf which separates the sentient

being from the non-sentient matter. It is impossible to deny the existence of sensation, it is impossible to account for it by any combination, however complicated, of non-sentient particles. The combination may produce many wonderful effects, but they must, as far as our reason can be trusted, produce effects not differing in essence from the qualities of the component parts.

An automaton may be constructed which shall walk, talk, write; but is it conceivable that it can be constructed so as to feel? And if this be possible, the fact cannot be explained on materialist principles: matter is by hypothesis non-sentient; the properties of matter, affinity, attraction, repulsion, and so on. You cannot conceive any combination of these qualities producing sensation or capacity for sensation; and if you admit sensation as a quality of matter, that sentient matter is not the matter of the materialist. Hence even the simple phenomenon of sen-

sation remains as much unaccounted for by modern as by ancient materialism.

The other incidents of animal life are still more inexplicable than those of mere sensation upon the material hypothesis. The suitableness of the organs of sense to receive the vibrations of the mediums with which they are in contact, the fitness of the internal organs to receive and assimilate air and food, the suitableness of the sexes to each other, and of one sex to the nourishment and rearing of progeny,—all these and many other arrangements, without which the races of animals, including man, must soon cease to exist,—all these aptitudes which the most robust believer in materialism would hardly venture to describe as the results of chance and accident,—seem to call loudly for at least an attempt at explanation from the advocates of a theory which professes to be founded on reason and experience.

IV.

THE THEORY OF DEVELOPMENT.

THE 'Theory of Development' would not, I think, supposing it to be established by observation, at all assist the materialists in surmounting these difficulties. The 'Theory of Development' assumes the existence of something to be developed, and that this something is organised, possessing a very simple organisation, it may be, but still possessing some organisation.

No difficulty is avoided by supposing the 'protoplasm' to be extremely small. Small and large are merely relative terms, and if a protoplasm has a definite form, it is conceivable that the protoplasm consists of parts as much smaller than the protoplasm itself, as it is smaller than the earth. Again, if we

admit that the organisation of the protoplasm is the result of chance, how are the development of organs of respiration, digestion, or of sense, to be accounted for? A living creature which possesses sight might be supposed to improve that sight through the desire of seeing more perfectly, but how can a being which does not see, and knows nothing of sight, form a desire to see? How and why is the rudimentary organ of sight formed? How is the desire of sight generated? Does matter in general desire to see, or only certain kinds of matter, or certain combinations of matter?

It is perfectly true that the organ of an animal is developed, by the animal being placed in circumstances which call for the use of that particular organ; it is true that the development of the organ may be transmitted to the posterity of the animal; but these facts are powerless to explain the origin of that which is developed.

Again, the causes that produce the phenomena of development, which are established by observation, are in no degree explained by the theory itself. Why does the desire to obtain more perfect results, by the use of a particular organ, improve that organ? Why are the peculiarities of the parent transmitted to the offspring? Why does an animal select as its mate one of the opposite sex distinguished for its beauty? To account for the fact as resulting from the principle of 'natural selection' is merely to say, in other words, that selection is observed to take place on this ground. Why it so takes place is left entirely unaccounted for.

Then with regard to the higher mental faculties: it is admitted on all hands that they are susceptible of improvement, through the desire and attempt to improve them, or simply by being used; but how can they originate in this desire or use? How can the desire to improve these faculties or the use of

them precede their existence? The 'Theory of Development,' as its name imports, never can explain the commencement of anything. When brought forward for this purpose, its propounders resemble the philosophers who taught that the earth was supported by an elephant, and the elephant by a tortoise, and so on. They merely remove the difficulty by one step, or by several steps. Supposing it to be established that the intellect of a man is only the developed intellect of a monkey, and that of a monkey the developed intellect of a dog, you must at length come to the end of the chain, and be brought face to face with the question, How did intellect in its lowest form originate?

It is clear therefore that while the Theory of Development may account for the augmentation of that which is, it cannot account for the generation of that which is not. If this theory should prevail, it may show how a simple sentient being is developed into a

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more complicated one, but it leaves untouched the question, How can non-sentient particles, in consequence of being arranged in a particular manner, become sentient? It is all very well to talk of 'protoplasm,' but the name does not remove the difficulty. A protoplasm on the hypothesis contains the germ of sensation. It is composed of particles, if the materialist theory be true; and if that theory be true, the particles of which it is composed are non-sentient. How then does the materialist theory account for sensation, either in protoplasms or in the development of protoplasms?

The conclusion then is that the materialist theory, the theory that attributes all phenomena to particles self-existent and possessing certain properties acting according to definite laws,—that this theory, while sufficient to explain many chemical phenomena, and promising to explain many others, entirely fails to explain the existence of

sensation, and, *a multo fortiori*, the existence of higher and more complicated mental phenomena.

The possibility still remains that certain particles of matter are endowed with sensation, and that sentient beings are composed, in part at least, of such particles. Such a supposition, however, is entirely fatal to materialism, which professes to explain mental phenomena by means of the ordinary properties of matter. To admit that certain self-constituted particles, such as, in this theory, material particles are supposed to be, possess also sentient properties, is, in effect, to admit the existence of mind, or that which is capable of sensation, existing like matter from all eternity. On this supposition the materialist theory fades away, and we again arrive at the ordinary belief in the existence of two principles—mind and matter.

The theory which would assume that the

higher mental qualities of sentient beings are composed of very numerous mental existences, in the same manner that a tangible body is composed of very numerous small particles, has, as far as I am aware, never been brought forward, at least in a complete shape. I will not therefore attempt to refute that which no one seriously propounds.

V.

HYPOTHESIS OF AN INTELLIGENT CAUSE.

HAVING considered the hypothesis which assumes the existence of an unintelligent power called Nature, and the theory which is based upon the eternal existence of matter possessing certain qualities, I proceed now to examine that which takes for its foundation a self-existent and intelligent power, proceeding as before with the inquiry, how far this theory agrees with observed phenomena. I shall afterwards consider a modification of this theory, which involves the supposition of an intelligent power, and also the existence of an unintelligent power called Nature, the two acting concurrently on most occasions, but

sometimes the former interfering with and overruling the latter. And I shall also refer to another modification of the theory of an intelligent power, which proceeds on the supposed existence of such an intelligent power, and also of matter, self-existing from eternity.

The supposition of a self-existent intelligent power, that is, an intelligent power existing without a cause, no doubt involves great difficulties. In the first place, we are accustomed to see events follow each other in a certain order; every event having a predecessor which occasioned the successor; and an event without a cause is to us inconceivable. The self-existence of an intelligent power stands, in this respect, on a level with the self-existence of unintelligent matter.

The fact, however, of matter being visible and tangible, while intelligence and power are neither the one nor the other, turns the

scale in favour of the self-existence of the former, upon the first impression, or if we trust to our senses only: and the constant contemplation of material objects, and the exclusive study of their properties, appear to strengthen this impression. We consequently find materialists actually assuming the eternal existence of matter as requiring no proof,—as a self-evident fact. Yet this self-existence of matter is not less difficult to conceive than the self-existence of intellect.

It may indeed be said that there is this difference in favour of the self-existence of matter, that we find the parts of matter retaining the same properties, notwithstanding any changes in their condition to which we can subject them. No application of heat or of other agents, however powerful, has ever been found to convert particles of silver into particles of gold. The particles of silver retain, so far as we can discern, precisely the same qualities as those which

they possessed before they were subjected to the treatment, however violent, however long continued. Hence it is concluded that these properties are unalterable, and from this, that they have existed for ever, and are therefore self-existing—existing without a cause.

It may further be said that, unlike material existences, mental existences apparently come to an absolute end; that if continued after death, we can perceive no trace of such continued existence; and that, therefore, it is more reasonable to believe in the existence of matter from eternity, than in the existence of intelligence from eternity.

This reasoning appears to me not without weight, although by no means conclusive. It is not conclusive, because we have no certain proof that the qualities of matter are absolutely unchangeable, although they may have undergone no sensible change for a long series of ages. Neither have we

any strict proof that mental existence is terminable.

Still, if the question between the mental and material theories was to be decided simply by an answer to the question, Which hypothesis involves the fewer difficulties? I am disposed to think it must be decided in favour of the material theory.

But we have to consider not merely which supposition is in itself the more probable, independently of the consequences derivable from it, but also which, if adopted, will the better explain observed phenomena. We have already seen, in a former chapter, how far the material hypothesis is successful in this respect. Let us now put to the same test the alternative hypothesis.

If we suppose that an intelligent power has eternally existed, it is evident that all observed phenomena may be accounted for as proceeding from this cause, provided the intelligence and power are admitted to be

sufficiently great. The importance and number of the effects which they may produce become merely a question of degree. A child one year old possesses a certain amount of power and intelligence, but it is prodigiously inferior, in this respect, to a man of twenty, and many of the effects which the man can produce are inconceivable by the child, and entirely beyond its comprehension. If we suppose another being exceeding the man in power and intelligence, in the same degree as that in which the man exceeds the child, then the effects which might be expected to follow the exertions of this superior being, would be incomprehensible to the man, although they might excite his astonishment and admiration.

Imagine now a degree of power and intelligence exceeding that of the intelligence and power, superior to the intelligence of man in the same proportion as the intelligence and power before supposed exceeded those of

man ; the effects which might be produced by such exalted power and intelligence would be still more wonderful and incomprehensible.

It is not too much to say, that the occurrence of all the wonderful phenomena which we perceive in the universe might be produced by power and intelligence, if we suppose the series of constantly increasing power and wisdom to be prolonged without limit.

Comparing then the material hypothesis with that of an intelligent power, we find, that, while the first accounts for some material phenomena, but fails entirely to explain the existence of sensation or any other mental phenomenon, the second, if adopted, is sufficient to account for all phenomena, both mental and material. Whilst, therefore, we admit that, taken without regard to the consequences deducible from it, the former is the more probable, this probability is entirely outweighed by that of the latter, when these consequences are taken into account.

Lucretius denies that the universe could be created and governed by the gods, on the ground that they could not possess sufficient power to produce the effects which we observe. But it is evident that this reasoning is based on the assumption, that the poet was acquainted with the limits of their power.

He would no doubt have equally asserted that the sun could not produce any motive effect upon the earth, if he had been aware that it would take a fleet horse (supposing his speed could be maintained) 500 years to pass over a distance equal to that of the sun from the earth: but still, on finding how completely the supposition of attraction exercised by the sun on the earth explained phenomena not explicable on any other hypothesis, he would no doubt have admitted the possibility of such an effect, even at a distance incomparably greater than that of the sun from the earth, as in the instance of comets.

VI.

HYPOTHESIS OF SELF-EXISTENT MATTER AND INTELLIGENCE.

I NOW proceed to consider two hypotheses compounded of those I have discussed, less on account of their importance than of the acceptance they have frequently met with.

The first of these hypotheses assumes at once the eternal and self existence of matter, and also the eternal existence of an intelligent power. This belief was much more prevalent in ancient than in modern times, and was adopted, I believe, by at least some sects of the Gnostics. The existence of evil was attributed to the intractability of matter,—matter which in its stubborn-

ness would not yield to the power of the supreme intelligence.

If we examine the properties of matter, we do not, I think, find much evidence of its rebellious nature. The surface of the earth is suitable for the production of vegetables, and these vegetables are absolutely necessary for the continued existence of animals. The interior of the earth contains various substances—coal, metals, etc.—which are highly suitable for various uses, when the labour and intelligence of man have been applied to them. That they are of little or no use without this application does not show that they are opposed to intelligence. Labour is not always, or even generally, an evil: it is often highly beneficial to him who exercises it. The uses of inert matter, as it is sometimes termed, are incalculable; and these uses are called into play, not by overcoming the properties of inert matter, but by taking advantage of them.

This Gnostic theory, in fact, appears to have originated, not from the observation of the properties of matter, but from a desire to account for the existence of evil; the attempt, however, must be admitted to be in this respect also a failure.

The theory seldom formally brought forward, yet often quietly assumed to be true, —that the universe has arisen from an intelligent cause, and also an unintelligent cause called Nature,—merits some attention, by reason of its frequent acceptance, if not from according with the conclusions of reason.

This theory supposes that certain things exist by nature, and certain others by the action of an intelligent cause.

The boundaries between the two creations have not been, as far as I am aware, exactly defined by those who entertain this opinion, but perhaps, according to the belief of the greater number, inanimate objects are the

production of nature, animated beings of an intelligent cause.

Now, in a former chapter, I have, I think, shown conclusively, that the assumption of an unintelligent cause, by whatever name it may be called, in no degree accounts for the known properties of matter, such as attraction, repulsion, and affinity, constantly acting in a manner so regular, that we can, in many instances, predict with certainty the changes in position and qualities, which in particular circumstances matter will undergo. Can we reasonably believe that this regularity, exact and constant, as far as our observations extend, is the work of chance? Is it a matter of chance that water is always found to be resolvable into one volume of oxygen and two of hydrogen? Is it a matter of chance that the planets move round the sun in curves varying from ellipses, by so much only as they would deviate, if acted upon by each other, according to a rule which we can state with

precision, and from which we can calculate beforehand the deviations which we afterwards observe? Yet if these results, this accurate and constant coincidence with a definite and predetermined rule is attributed to a non-intelligent cause, whether you call that cause Nature or by another name, then this wonderful coincidence is, in other words, the effect of chance.

It is obvious, then, that in order to avoid a conclusion so untenable as this, we must, if we suppose that inanimate things exist independently of an intelligent cause, and animated beings by means of such a cause, again assume that the various qualities of inanimate matter, with which we are acquainted, are self-existent, and that the intelligent cause which we also assume, in this hypothesis, acts upon such matter in order to form animated beings. But this hypothesis is open to an objection which appears to me fatal. One of the supposi-

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tions on which it rests is unnecessary, if the other supposition is admitted. The assumption of an intelligent cause, endowed with sufficient power, is able, though standing alone, to account for all phenomena, both of inanimate matter and of animated beings. The introduction of the supposition that inanimate matter and its infinite variety of properties are self-existent, is therefore superfluous, and consequently unphilosophical.

I have thought it worth while to treat this subject at some length, and with some minuteness, because there has prevailed of late an impression that the rapid advance of science has, in some way, shaken the basis of the belief, respecting the origin of man and the universe, entertained (with few exceptions) by the greatest philosophers from Socrates to Newton. And this impression has not been confined to those who have adopted materialistic views : it has also affected many who were previously convinced that the

reasoning in favour of an intelligent cause was unassailable. Many have been seized by an apprehension, that their faith was being steadily though secretly undermined by the current of scientific discovery. It may allay these apprehensions to remember, that they were not entertained by him to whom the extension of science must be chiefly attributed, whose own discoveries were the most important of all that have been made in the realms of science, the most important it may be in themselves, but certainly the most important in this, that they gave an impulse and a true direction to investigation, by displaying the brilliant results which attend an adherence to a sound method of investigation.

Sir Isaac Newton, when he contemplated 'the great ocean of truth which lay unexplored' before him, did not appear to entertain any apprehension that, if he had been permitted to navigate it, he would have

been in danger of making shipwreck of his faith in the cause of its existence. The expression of which he made use leads us to suppose that he foresaw a constant advance of scientific discovery; but if we consider the principles of research which he had laid down, and acted upon with such unprecedented success, we must feel convinced that he could not conceive it possible, from the domain of law and order being more and more widely extended, men would find stronger and yet stronger evidence that the universe is governed by chance or aimless laws, and less and less probability that it is subordinate to the direction of intelligence.

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